

MAR 24 2010

REMARKS/ARGUMENTS

In view of the following remarks, the applicants respectfully submit that the pending claims are not rendered obvious under 35 U.S.C. § 103. Accordingly, it is believed that this application is in condition for allowance. If, however, the Examiner believes that there are any unresolved issues, or believes that some or all of the claims are not in condition for allowance, the applicants respectfully request that the Examiner contact the undersigned to schedule a telephone Examiner Interview before any further actions on the merits.

The applicants will now address each of the issues raised in the outstanding Office Action.

Rejections under 35 U.S.C. § 103

Claims 1-16, 18-21, 29-44, 46-49, 51 and 53 are rejected under 35 U.S.C. § 103(a) as being unpatentable over "Network Working Group RFC 1583," OSPF Version 2 ("the Moy paper"), "Network Working Group Internet Draft," Fast Liveness Protocol (FLIP) ("the Sandick paper"), U.S. Patent Application Publication No. 2004/0121792 ("the Allen publication") and U.S. Patent No. 7,417,987 ("the Shenoy publication"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

First, in rejecting independent claims 1 and 29, the Examiner contends that the Moy paper teaches accepting forwarding liveness status information, composing a message including the forwarding liveness status information, and sending the messages towards a neighbor node. (See Paper No. 20091202, page 4.) Although the Examiner concedes that the Moy paper does not disclose accepting forwarding liveness status information *of at least two different interfaces and composing an aggregated message*, the Examiner contends that the list of neighbor interfaces included in a FLIP Advertisement Message described in the Sandick paper teaches accepting forwarding liveness status information *of at least two different interfaces and composing an aggregated message*. The applicants respectfully disagree.

Embodiments consistent with the claimed invention may be used to provide a "liveness detection mechanism" for quickly detecting a down interface used by nodes on a network by exchanging messages which include aggregated protocol and/or forwarding liveness ("APFL") *status* information with neighboring nodes. The APFL *status* information may contain, for example, the status of the at least two different interfaces used by the nodes. This feature provides several advantages. As the specification states:

hello messages [in conventional liveness detection mechanisms] often carry more than just liveness information, and can therefore be fairly large and require non trivial computational effort to process. Consequently, running fast liveness detection between a pair of neighbor nodes, *each running multiple protocols*,

can be expensive in terms of communications and computational resources required to communicate and process the frequent, lengthy messages for liveness detection. [Emphasis added.]

(Paragraph [0009] of the present application) These conventional liveness detection mechanisms require separate hello messages for each different interface used by the node. The ability to send **aggregated forwarding liveness status information of multiple interfaces** overcomes this issue as follows:

By providing a small number of bits per protocol, which relay a simple set of information (**such as up, down, not reporting, restarting, etc.**), a compact, simple message may be used for **conveying liveness related information**. Since the messages are small **and can aggregate information from more than one protocol, they can be sent frequently**. [Emphasis added.]

(Paragraph [0086] of the present application) As can be appreciated from the foregoing, the forwarding liveness status information of multiple interfaces can be aggregated into a single message wherein each state of the interfaces included in the aggregated message may be set to up, down, not reporting or restarting. **Thus, as recited, the aggregated message includes (1) at least two indicators, each indicator identifying a different one of the at least two different interfaces and (2) corresponding forwarding liveness status information of the at least two different interfaces.**

By contrast, the Sandick paper includes a "list of neighbor interfaces that the transmitting device has

heard from." (Section 4.2 of the Sandick paper.) The described list is "[a] **list of all source IP addresses of all FLIP Advertisements that have been heard on this interface.** [Emphasis added.]" (Section B.1 of the Sandick paper.) **This list of neighbor interfaces that the transmitting device has heard from does not indicate the status of the at least two different protocols being used by the neighboring nodes.** Rather, in the Sandick paper, **a node can only infer that status of its own interface with the neighbor node.** Specifically, the Sandick paper provides:

When a device receives a FLIP Advertisement from a neighbor, it lists the neighbor interface in its own FLIP advertisements for that interface. If a device receives an advertisement containing its own interface in one of the neighbor fields and it has listed that neighbor in its own advertisement, a FLIP adjacency is established. If an advertisement containing the receiving device interface has not been received from a neighbor in FLIPAdvertisementDeadInterval seconds, then that neighbor is removed from subsequent advertisements (for that interface) and the adjacency is considered down.

(Section 4.5 of the Sandick paper.) As can be appreciated from the foregoing, even though a FLIP Advertisement message may include a **list** of all source IP addresses of all nodes that the transmitting node has heard from, **the receiver node can only infer the status of its interface with the sending node.** That is, the inclusion source IP addresses in the FLIP Advertisement do not provide the **status** of the source nodes interface.

In addition, the list of all source IP addresses of all nodes that the transmitting node has heard from in the Sandick paper is used to determine adjacencies between nodes. However, the statuses of specific interfaces of nodes are more specific than the status of adjacencies between nodes. Thus, the Sandick paper neither teaches, nor makes obvious, accepting forwarding liveness *status* information of at least two different interfaces (e.g., *which indicates whether the at least two interfaces are up, down, not responding, or restarting*) and composing an aggregated message including the forwarding liveness status information of the at least two different interfaces as data within the aggregated message.

Furthermore, the purported teachings of the Moy paper, the Allen publication and the Shenoy patent do not compensate for the aforementioned deficiencies of the Sandick paper.

Thus, independent claims 1 and 29 are not rendered obvious by the cited references for at least this first reason. Independent claims 11, 18, 39 and 46 are similarly not rendered obvious by the cited references. Since claims 2-10 and 51 directly or indirectly depend from claim 1, since claims 12-16 and 53 directly or indirectly depend from claim 11, since claims 19-21 depend from claim 18, since claims 30-38 directly or indirectly depend from claim 29, since claims 40-44 depend from claim 39, and since claims 47-49 depend from claim 46, these claims are similarly not rendered obvious by the cited references.

Second, in rejecting claims 1 and 29, the Examiner contends

Moy does not explicitly disclose, however Shenoy discloses forwarding liveness status information includes an integrity and correct operation of a forwarding table used by the data forwarding device (Shenoy; column 5 lines 15-17, column 6 lines 45-48, column 8 line 66- column 9 line 3; **discloses forwarding information includes correct forwarding table information used to correct errors and update forwarding tables**). [Emphasis added.]

(See Paper No. 20091202, page 5.) The applicants respectfully disagree.

The Shenoy patent concerns the distribution of forwarding information in routers

using two different communications channels where one of the communications channels is characteristically reliable yet relatively slow and where the other one of the communications channels is characteristically unreliable yet relatively fast. The forwarding information that is distributed via the relatively fast communications channel can be used to rapidly update forwarding tables such as hardware forwarding tables **while the forwarding information that is distributed via the reliable communications channel can be used to resolve errors that may occur during distribution via the relatively fast communications channel**. [Emphasis added.]

(Abstract of the Shenoy patent) The distribution of forwarding information can be tracked in the Shenoy patent

by associating unique sequence numbers with the messages that carry the forwarding information. The sequence numbers are used to identify and resolve transmission errors. In an embodiment, the sequence numbers of messages are compared to expected sequence numbers to determine if duplicate messages have been sent and to determine if messages have been lost. [Emphasis added.]

(Column 2, lines 11-18 of the Shenoy patent) By way of example with respect to Figures 6A-6F, the Shenoy patent describes *that it is the order of the sequence numbers associated with the messages that carry the forwarding information which is used to determine transmission errors.* (See column 10, line 12 through column 11, line 60 of the Shenoy patent.) The use of sequence numbers to determine transmission errors in the sending of a message carrying forwarding information (i.e., the correct transmission of the message) does not teach or make obvious that the forwarding liveness status information *includes an integrity and correct operation of a forwarding table used by the data forwarding device* within the message itself.

Furthermore, the purported teachings of the Moy paper, the Sandick paper and the Allen publication do not compensate for the aforementioned deficiencies of the Shenoy patent.

Thus, independent claims 1 and 29 are not rendered obvious by the cited references for at least this second reason. Independent claims 11, 18, 39 and 46 are similarly not rendered obvious by the cited references. Since claims 2-10 and 51 directly or indirectly depend from claim 1, since claims 12-16 and 53 directly or

indirectly depend from claim 11, since claims 19-21 depend from claim 18, since claims 30-38 directly or indirectly depend from claim 29, since claims 40-44 depend from claim 39, and since claims 47-49 depend from claim 46, these claims are similarly not rendered obvious by the cited references.

Claims 17, 22, 45 and 50 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Moy and Sandick papers, the Allen publication and the Shenoy patent as applied to claims 11, 18, 39, and 46 above, and further in view of "Network Working Group RFC 1989," PPP Link Quality Monitoring (August 1996) ("the Simpson paper"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Claims 17, 22, 45 and 50 depend from claims 11, 18, 39 and 46, respectively. Since the purported teachings of the Simpson paper do not compensate for the deficiencies of the Moy and Sandick papers, the Allen publication and the Shenoy patent with respect to claims 11, 18, 39 and 46 (discussed above), these claims are not rendered obvious by the Moy, Sandick and Simpson papers, the Allen publication and the Shenoy patent regardless of the purported teachings of the Simpson paper, and regardless of the presence or absence of an obvious reason to combine these references as proposed by the Examiner.

Claims 52 and 54 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Moy and Sandick papers, the Allen publication and the Shenoy patent as applied to

claims 1 and 29 above, and further in view of U.S. Patent No. 7,362,700 ("the Frick patent"). The applicants respectfully request that the Examiner reconsider and withdraw this ground of rejection in view of the following.

Claims 52 and 54 depend from claims 1 and 11, respectively. Since the purported teachings of the Frick patent do not compensate for the deficiencies of the Moy and Sandick papers, the Allen publication and the Shenoy patent with respect to claims 1 and 11 (discussed above), these claims are not rendered obvious by the Moy and Sandick papers, the Allen publication and the Shenoy and Frick patents, regardless of the purported teachings of the Frick patent, and regardless of the presence or absence of an obvious reason to combine these references as proposed by the Examiner.

Conclusion

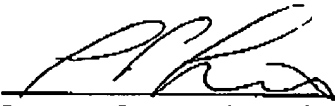
In view of the foregoing remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

Any arguments made in this request for reconsideration pertain **only** to the specific aspects of the invention **claimed**. Any claim amendments or cancellations, and any arguments, are made **without prejudice to, or disclaimer of**, the applicants' right to seek patent protection of any unclaimed (e.g., narrower, broader, different) subject matter, such as by way of a continuation or divisional patent application for example.

Since the applicants' remarks, amendments, and/or filings with respect to the Examiner's objections and/or rejections are sufficient to overcome these objections and/or rejections, the applicants' silence as to assertions by the Examiner in the Office Action and/or to certain facts or conclusions that may be implied by objections and/or rejections in the Office Action (such as, for example, whether a reference constitutes prior art, whether references have been properly combined or modified, whether dependent claims are separately patentable, etc.) is not a concession by the applicants that such assertions and/or implications are accurate, and that all requirements for an objection and/or a rejection have been met. Thus, the applicants reserve the right to analyze and dispute any such assertions and implications in the future.

Respectfully submitted,

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March 24, 2010
Date